



Lumbar Spine Research Society 10th Annual Meeting

SCIENTIFIC PROGRAM

April 6, 2017 - Thursday

7:00-7:10 am

Welcome and Opening Comments

Jonathan Grauer, MD

Session #1

Moderators:

(7:10-7:37)

7:10-7:15 **Paper 1**

Blood Loss / Thromboembolism

Andrew Daily, MD and Thomas A. Zdeblick, MD

Efficacy and Safety of High-dose Tranexamic Acid Protocol in Adult Spinal Deformity – Analysis of 100 Consecutive Cases

*James Lin, MD, MS; Jamal Shillingford, MD; **Joseph Laratta, MD**; Lee Tan, MD; Charla Fischer, MD; Ronald Lehman, MD; Lawrence Lenke, MD*

7:16-7:21 **Paper 2**

Comparison of Bleeding vs. Clotting Complications after Lumbar Spine Surgery

Haroutioun Boyajian, MD; *Olumuyiwa Idowu, BA; William Mosenthal, MD; Lewis Shi, MD; Michael Lee, MD*

7:22-7:27 **Paper 3**

Pharmacologic Prophylaxis for Venous Thromboembolism in Elective Spine Surgery

Ryan McLynn, BS; *Patawut Bovonratwet, BS; Nathaniel Ondeck, BS; Jonathan Cui, BS; Taylor Ottesen, BS; Blake Shultz, BA; Jonathan Grauer, MD*

7:27-7:37

DISCUSSION

Session # 2

Moderators:

(7:37-8:04)

7:37- 7:42 **Paper 4**

Infections

Paul Arnold, MD and Don Moore, MD

Fever Following Lumbar Fusion Procedures

Fady Hijji, BS; *Ankur Narain, BA; Daniel Bohl, MD, MPH; Benjamin Mayo, BA; Dustin Massel, BS; Krishna Kudaravalli, BS; Kelly Yom, BA; Kern Singh, MD*

7:43-7:48 **Paper 5**

Betadine Irrigation and Intrawound Vancomycin Powder Prevent Wound Complications Following Lumbosacral Tumor Surgery.

Addisu Mesfin, MD

7:49-7:54 **Paper 6**

Outcomes of Suprafascial Vacuum Assisted Closure Device in Spine Surgical Site Infections Management

*Swamy Kurra, MBBS; Richard Tallarico, MD; **Mike Sun, MD**; William Lavelle, MD*

7:54-8:04

DISCUSSION

Session #3

Moderators:

(8:04 - 8:37)

8:04-8:09 **Paper 7**

Complications

Jonathan Sembrano, MD and Bartoz Wojewnik, MD

Can a surgeon's demographic factors predict postoperative complication rates after an elective spinal fusion?

Gurmit Singh, BS; *Danielle Chun, MD; Ralph Cook, BS; Joseph Weiner, BS; Michael Schallmo, BS; Kathryn Barth, BS; Sameer Singh, BS; Ryan Freshman, BS; Alpesh Patel, MD, FACS; Wellington Hsu, MD*

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- 8:10-8:15 **Paper 8** Adverse Events following Posterior Lumbar Fusion: A Comparison of Spine Surgeons Perceptions at LSRS and Reported Data for Rates and Risk Factors
Nathaniel Ondeck, BS; Daniel Bohl, MD, MPH; Patawut Bovonratwet, BS; Ryan McLynn, BS; Jonathan Cui, BS; Andre Samuel, BBA; Matthew Webb, AB; Jonathan Grauer, MD
- 8:16-8:21 **Paper 9** Rates of Mortality Among Lumbar Spine Surgical Procedures and Factors Associated with its Occurrence Over a Ten Year Period: A Study of 803,949 Patients on the Nationwide Inpatient Sample
Gregory Poorman, BA; John Moon, BS; Samantha Horn, BA; Olivia Bono, BA; Anna-Marie Francis, BA; Cyrus Jalai, BA; **Peter Passias, MD**
- 8:22-8:27 **Paper 10** Inaccuracies in ICD Coding for Obesity Bias Toward Higher Frequency of Coding in Patients with Increased Comorbidities and Correlate with Postoperative Complications: A Limitation for Spine Studies Using Administrative Databases
Ryan McLynn, BS; Benjamin Geddes, MD; Jonathan Cui, BS; Nathaniel Ondeck, BS; Patawut Bovonratwet, BS; Blake Shultz, BA; Jonathan Grauer, MD
- 8:27-8:37 DISCUSSION
- SYMPOSIUM #1**
Trauma – AOSpine
Moderators: Jens Chapman, MD
(8:37-9:22)
- 8:37-8:47 A fresh approach to classifying Spine Trauma: the new AO TL fracture classification system.
Gregory Schroeder, MD
- 8:47-8:52 Discussion
- 8:52-9:02 Posttraumatic TL kyphosis – when does it matter?
Christopher Shaffrey, MD
- 9:02-9:07 Discussion
- 9:07-9:17 Recent insights in recovery from TL SCI. The results of STASCIS and NACTN databanks
Jefferson Wilson, MD
- 9:17-9:22 Discussion
- 9:22-9:42 Break**
- 9:22-9:42 Breakout Poster Session -1**
Moderators: Bradford Currier, MD and Leo Spector, MD
- 9:22-9:24 **Poster 1** Trends in Primary and Revision Laminectomy in the United States from 2006 to 2014
Comron Saifi, MD; Joseph Laratta, MD; Andrew Pugely, MD; Alejandro Cazzulino, BA; Edward Goldberg, MD; Ronald Lehman, MD; Lawrence Lenke, MD; Howard An, MD; Frank Phillips, MD;
- 9:24-9:26 DISCUSSION
- 9:27-9:29 **Poster 2** 90-day reimbursements for primary single level posterior lumbar interbody fusion from commercial and Medicare data
Nikhil Jain, MD; Frank Phillips, MD; Safdar Khan, MD
- 9:29-9:31 DISCUSSION
- 9:32-9:34 **Poster 3** Development of Common Language Descriptions Correlating with PROMIS
Jason Ferrel, MD; Chong Zhang, MS; Angela Presson, PhD; Rasheed Abiola, MD; Nicholas Spina, MD; W. Ryan Spiker, MD; Brandon Lawrence, MD; Darrel Brodke, MD
- 9:35-9:37 DISCUSSION

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- 9:37-9:39 **Poster 4** PROMIS Physical Function Outcomes in Diabetic Patients Undergoing Lumbar Spine Surgery
Mathieu Squires, BS; Ashley Neese, BS; Yue Zhang, PhD; Brandon Lawrence, MD; W. Ryan Spiker, MD; Darrel Brodke, MD
- 9:40-9:42 DISCUSSION
- Session #4**
Moderators:
(9:42- 10:31)
9:42-9:44 **RF Paper 1** The Effectiveness of Bioskills Module for Simulated Lumbar Pedicle Screw Instrumentation
Sohaib Hashmi, MD; Barrett Boody, MD; Joseph Maslak, MD; Michael McCarthy, MD; Alpesh Patel, MD, FACS; Wellington Hsu, MD
- 9:45-9:47 **RF Paper 2** Resident Involvement as a Risk Factor in Anterior Lumbar Fusion Outcomes
Samantha Jacobs, BA; William Ranson, BS; Chierika Ukogu, BA; Jun Kim, MD; John Di Capua, MHS, BS; Sulaiman Somani, BS; Lully Vargas, BSN; Samuel Cho, MD
- 9:48-9:50 **RF Paper 3** Assessing Online Patient Education Readability for Spine Surgery Procedures
Ankur Narain, BA; Fady Hijji, BS; William Long, BA; Krishna Modi, BS; Dustin Massel, BS; Benjamin Mayo, BA; Kern Singh, MD
- 9:51-9:53 **RF Paper 4** Is Physical Therapy Helpful After Lumbar Spine Surgery? A Multivariate Analysis of 1130 Patients
Ananth Eleswarapu, MD; Srikanth Divi, MD; Lewis Shi, MD; Douglas Dirschl, MD; James Mok, MD; Christopher Stout, PhD; Michael Lee, MD
- 9:54-9:56 **RF Paper 5** What Are the Differences in Medicare DRG Reimbursement for MIS Deformity Surgery in Academic vs Private Hospitals in Different Geographic Regions?
Pierce Nunley, MD; Gregory Mundis, MD; Robert Eastlack, MD; **Dean Chou, MD**; Christopher Shaffrey, MD; Praveen Mummaneni, MD; International Spine Study Group (ISSG)
- 9:57 – 10:07 AM DISCUSSION
- Rapid Fire Presentations: Complications**
- 10:07-10:09 **RF Paper 6** Prevalence of Pre-Operative Lower Urinary Tract Symptoms Among Patients Undergoing Elective Lumbar Spine Surgery
Elizabeth Lieberman, MD; Stephanie Radoslovich, BA; Ryan Boone, BS; Valentina Haj, BS; Jayme Hiratzka, MD; Lynn Marshall, Sc.D.; Jung Yoo, MD
- 10:10-10:12 **RF Paper 7** Risk of Surgical Site Infection and Mortality Following Lumbar Fusion Surgery in patients with Chronic Steroid Usage and Chronic Methicillin Resistant Staphylococcus Aureus (MRSA) infection
Rabia Qureshi, BS; Dennis Chen, MD; Ali Nourbakhsh, MD; Hamid Hassanzadeh, MD; Adam Shimer, MD; Francis Shen, MD; **Anuj Singla, MD**
- 10:13-10:15 **RF Paper 8** The Risk of Postoperative Surgical Site Infection Following Lumbar Spine Surgery after Exposure to Steroids at the Time of Surgical Intervention
Louis Jenis, MD; Benjamin Cowan, BA
- 10:16-10:18 **RF Paper 9** Associations between Preoperative Hyponatremia and Perioperative Complications in Lumbar Spinal Fusion
Thomas Bomberger, BA; Joseph Tanenbaum, BS; Daniel Lubelski, MD; Michael Steinmetz, MD; Edward Benzel, MD; Thomas Mroz, MD

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10:19-10:21 RF Paper 10	Thirty-Day Complications of Navigated Versus Conventional Single-Level Instrumented Posterior Lumbar Fusion: An ACS-NSQIP Analysis Patawut Bovonratwet, BS ; <i>Stephen Nelson, MD; Nathaniel Ondeck, BS; Benjamin Geddes, MD; Jonathan Grauer, MD</i>
10:21-10:31	DISCUSSION
Session #5 Moderators: (10:31 – 10:58)	Bundled Payments Alpesh Patel, MD and Theodore Koreckij, MD
10:31-10:36 Paper 11	Is There Value in Retrospective 90-day Bundle Payment Models for Lumbar Spine Fusion Procedures? Susan Odum, PhD ; <i>Bryce Van Doren, MPA, MPH; Leo Spector, MD</i>
10:37-10:42 Paper 12	Incidence of 90 Day Readmissions Following Posterior Lumbar Fusion Jonathan Cui, BS ; <i>Raj Gala, MD; Nathaniel Ondeck, BS; Ryan McLynn, BS; Patawut Bovonratwet, BS; Blake Shultz, BA; Jonathan Grauer, MD</i>
10:43-10:48 Paper 13	90-day bundled payment for primary single level lumbar discectomy/decompression: what does ‘big data’ say? Nikhil Jain, MD ; <i>Sohrab Virk, MD; Frank Phillips, MD; Elizabeth Yu, MD; Safdar Khan, MD</i>
10:48-10:58	DISCUSSION
Awards, Grants, and Presidential Address Moderators: (10:58 - 12:00)	Bruce Darden, MD and Thomas Zdeblick, MD
<u>Research Award Announcements</u>	
10:58 – 11:00(2min)	2017 Resident and Fellow PASE Awards
<u>Research Grant Recipients</u>	
11:00-11:05 (5min)	LSRS Research Grant: What we’ve gotten for our money Bruce V. Darden, II, MD <i>LSRS Research Committee Chair</i>
11:05-11:08 (3 min)	Announcement: 2017 LSRS Research Grant Award Winner Kevin Baker, Ph.D. <i>William Beaumont Hospital</i>
11:08-11:18 (10min)	2016 Research Grant Recipient Update Clinton Devin, MD <i>Vanderbilt University</i> “Randomized Clinical Trial to determine Efficacy and Feasibility of Using Predictive Model Based Calculator as a Shared Decision-Making Tool for Lumbar Spine Surgery”
11:18-11:25 (7 Min)	DISCUSSION
<u>Transfer of Presidents</u>	
Introduction: 11:25-11:30 (5 min)	Thomas Zdeblick, MD <i>President 2008 - 2011</i>
11:30-11:55 (25 min)	PRESIDENTIAL ADDRESS: Paul A. Anderson, MD, <i>President 2015-2017</i>

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11:55 - 12:00 (5 min)

Incoming President: Robert F. Heary, MD, 2017-2019

Introduction/Pin Ceremony: Paul A. Anderson, MD

12:00-1:00

LUNCH/BUSINESS MEETING

Session #6

Moderators:

(1:00 – 1:27)

1:00-1:05 **Paper 14**

Deformity 1

Clifford Tribus, MD and D. Kojo Hamilton, MD

National Trends for Spinal Deformity Surgery throughout the United States

Comron Saifi, MD; Joseph Laratta, MD; Joseph Lombardi, MD; Jamal Shillingford, MD; Nathan Hardy, BS; Andrew Pugely, MD; Frank Phillips, MD; Ronald Lehman, MD; Howard An, MD; Lawrence Lenke, MD

1:06-1:11 **Paper 15**

A Predictive Nomogram for Clinical Outcomes following Surgical Correction of Adult Spinal Deformity

Akshay Sharma, BA; Syed Mehdi, BS; Sagar Vallabh, MS; Emily Hu, BA; Joseph Tanenbaum, BS; Michael Steinmetz, MD; Edward Benzel, MD; Thomas Mroz, MD; Jason Savage, MD

1:12-1:17 **Paper 16**

Frailty and Health Related Quality of Life Improvement Following Adult Spinal Deformity Surgery

Daniel Reid, MD, MPH; Alan Daniels, MD; Tamir Ailon, MD; Justin Smith, MD; Christopher Shaffrey, MD; Virginie Lafage, PhD; Robert Hart, MD; Emily Miller, MD; Shay Bess, MD; Christopher Ames, MD

1:17-1:27

DISCUSSION

Session #7

Moderators:

(1:27 – 2:00)

1:27-1:32 **Paper 17**

Deformity 2

William Lavelle, MD and Joshua Heller, MD

Outcomes of Open Staged Corrective Surgery in the Setting of Adult Spinal Deformity

Peter Passias, MD; Gregory Poorman, BA; Cyrus Jalai, BA; Breton Line, BS; Bassel Diebo, MD; Samantha Horn, BA; Virginie Lafage, PhD; Shay Bess, MD; Thomas Errico, MD; International Spine Study Group (ISSG)

1:33-1:38 **Paper 18**

Visual Loss Following Spine Surgery: What Have We Seen Within the Scoliosis Research Society (SRS) Morbidity and Mortality Database?

Jamal Shillingford, MD; Joseph Laratta, MD; Nana Sarpong, MD, MBA; Ronald Lehman, MD; Lawrence Lenke, MD; Charla Fischer, MD

1:39-1:44 **Paper 19**

Outcomes of Lumbopelvic Fixation for the Treatment of Adult Deformity with a Modified Iliac Screw Starting Point

Ehsan Jazini, MD; Kevin Khalsa, MD; Tristan Weir, BS; Kelley Banagan, MD; Eugene Koh, MD, PhD; Steven Ludwig, MD; Daniel Gelb, MD; Luke Brown, MD

1:45-1:50 **Paper 20**

Instrumentation Complication Rates Following Spine Surgery: A Report from the Scoliosis Research Society (SRS) Morbidity and Mortality Database

Jamal Shillingford, MD; Joseph Laratta, MD; Nana Sarpong, MD, MBA; Ronald Lehman, MD; Lawrence Lenke, MD; Charla Fischer, MD

1:50 – 2:00

DISCUSSION

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Symposium #2

Moderators:

(2:00 – 2:45)

2:00-2:05 (5min)

Strategies for Management of Persistent Pain After Surgery

Dean Chou, MD

Introduction

Dean Chou, MD

2:05-2:15 (10min)

Structural workup of the patient with persistent pain after surgery

Wellington Hsu, MD

2:15-2:25 (10min)

Interventional therapies for the patient with persistent pain after surgery

Ankit Mehta, MD

2:25-2:35 (10min)

Non-pharmacologic therapies for the patient with persistent pain after surgery

Jason Savage, MD

2:35-2:45 (10 min)

Discussion

2:45-3:05

Break

2:45-3:05 Breakout

Poster Session -2

Moderators: **Scott Daffner, MD and Timothy Witham, MD**

2:45-2:47 Poster 5

Radiographic and Clinical Outcomes of Anterior and Transforaminal Lumbar Interbody Fusions: A Systematic Review and Meta-Analysis of Comparative Studies

Remi Ajiboye, MD; Haddy Alas, BA; Akshay Sharma, BA; Sina Pourtaheri, MD

2:48-2:50

DISCUSSION

2:50-2:52 Poster 6

Open fixation and fusion versus percutaneous pedicle screw fixation for treatment of thoracolumbar flexion distraction injuries

Assem Sultan, MD; Joseph Drain, MD; Jonathan Belding, MD; Michael Kelly, MD; James Liu, MD; Michael Steinmetz, MD; Timothy Moore, MD

2:53-2:55

DISCUSSION

2:55-2:57 Poster 7

Hospital Ownership and Teaching Status Affects Perioperative Outcomes Following Lumbar Spinal Fusion

Wesley Durand, ScB; Joseph Johnson, ScB; Neill Li, BS, MD; JaeWon Yang, BA; Adam Eltorai, BA; J. Mason DePasse, MD; Alan Daniels, MD

2:58-3:00

DISCUSSION

3:00-3:02 Poster 8

In Hospital Narcotic Usage Is Significantly Lower for Minimally Invasive Spine Surgery Versus Open Spine Surgery

David Falk, MD Student; Michael Hoy, MD Student; Darshan Vora, MD Student; Natalie Studdard, NP; Warren Yu, MD; Joseph O'Brien, MD, MPH

3:03-3:05

DISCUSSION

Session #8

Moderators:

(3:05 – 3:55)

3:05-3:07 RF Paper 11

Rapid Fire Presentations: Imaging

Louis Jenis, MD and Scott Tromanhauser, MD

The Prevalence of Spinal Epidural Lipomatosis On Magnetic Resonance Imaging

Nina Theyskens, MD; Nuno Paulino Pereira, MD; Stein Janssen, MD; Thomas Cha, MD, MBA; Joseph Schwab, MD, MS

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- 3:08-3:10 **RF Paper 12** Validating The Clinical Significance of The CARDS Classification For Degenerative Spondylolisthesis Through Preoperative Outcome Measures
Rasheed Abiola, MD; Jason Ferrel, MD; Nicholas Spina, MD; W. Ryan Spiker, MD; Brandon Lawrence, MD; Darrel Brodke, MD
- 3:11-3:13 **RF Paper 13** Utility of Supine Lateral Radiographs in Assessment of Lumbar Segmental Instability in Degenerative Lumbar Spondylolisthesis
Foster Chen, MD; Sandip Tarpada, BA; Woojin cho, MD, PhD
- 3:14-3:16 **RF Paper 14** 2-5 Year Follow Up on S2AI Pelvic Fixation
Evan Smith, MD; Justin Kyhos, MD; Robert Dolitsky, MD; Warren Yu, MD; Joseph O'Brien, MD, MPH
- 3:17-3:19 **RF Paper 15** Radiographic Analysis of Psoas Morphology and its Association with Neurovascular Structures at L4-5
Philip Louie, MD; Ankur Narain, BA; Fady Hijji, BS; Alem Yacob, MD; Bryce Basques, MD; Kelly Yom, BA; Frank Phillips, MD; Kern Singh, MD
- 3:20-3:30 DISCUSSION
- Rapid Fire Presentations: Surgical Techniques**
- 3:30-3:32 **RF Paper 16** National Trends in the Utilization of Vertebroplasty and Kyphoplasty Procedures throughout the United States
Joseph Laratta, MD; Nathan Hardy, BS; Jamal Shillingford, MD; Joseph Lombardi, MD; James Lin, MD, MS; Comron Saifi, MD; Andrew Pugely, MD; Charla Fischer, MD; Lawrence Lenke, MD; Ronald Lehman, MD
- 3:33-3:35 **RF Paper 17** A Retrospective Study of Thoracolumbar Burst Fractures Treated with Fixation and Non-fusion Surgery of Intra-vertebral Bone Graft Assisted with Balloon Kyphoplasty
Chengmin Zhang, PhD; Paul Arnold, MD; Qiang Zhou, MD
- 3:36-3:38 **RF Paper 18** Radiographic Evaluation of Percutaneous Pedicle Screw Constructs Including Minimally Invasive Facet Fusions for Unstable Spinal Column Injuries
Daniel Cavanaugh, MD; Tristan Weir, BS; Kelley Banagan, MD; Eugene Koh, MD, PhD; Daniel Gelb, MD; Steven Ludwig, MD; Luke Brown, MD
- 3:39-3:41 **RF Paper 19** Clinical and Radiographic Analysis of Expandable versus Static Lateral Lumbar Interbody Fusion Devices with One-Year Follow-up
Joseph O'Brien, MD, MPH; Daina Brooks, BS; Ingrid Luna, MPH; Gita Joshua, MA; Richard Frisch, MD
- 3:42-3:44 **RF Paper 20** National Treatment Trends and Perioperative Outcomes of Surgical Options for Degenerative Spondylolisthesis: An ACS-NSQIP study with comparison to prior LSRS survey results
Patawut Bovonratwet, BS; Matthew Webb, AB; Nathaniel Ondeck, BS; Jonathan Cui, BS; Ryan McLynn, BS; Kadimcherla Praveen, MD; David Kim, MD; Jonathan Grauer, MD
- 3:45-3:55 DISCUSSION
- Session #9**
Moderators:
(3:55 – 4:22)
- OR Tools**
Raymond Hah, MD and Gregory Graziano, MD

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- 3:55-4:00 **Paper 21** Bone Morphogenetic Protein Use in Lumbar Spine Surgery in The United States: How Have We Responded to The Warnings?
Javier Guzman, MD; Robert Merrill, BS; Jun Kim, MD; Samuel Overley, MD ; James Dowdell, MD; Sulaiman Somani, BS; Andrew Hecht, MD; Samuel Cho, MD; Sheeraz Qureshi, MD, MBA
- 4:01-4:06 **Paper 22** National Trends in the Utilization of Intraoperative Neuromonitoring throughout the United States
Joseph Laratta, MD; Nathan Hardy, BS; Jamal Shillingford, MD; Joseph Lombardi, MD; Comron Saifi, MD; Andrew Pugely, MD; Howard An, MD; Frank Phillips, MD; Ronald Lehman, MD; Lawrence Lenke, MD
- 4:07-4:12 **Paper 23** Circumferential Fusion: A Comparative Analysis Between ALIF and TLIF for the Indication of L5-S1 Isthmic Spondylolisthesis
Erik Tye, BA; Andrea Alonso, BS; Joseph Tanenbaum, BS; Roy Xiao, BA; Thomas Mroz, MD; Michael Steinmetz, MD; Jason Savage, MD
- 4:12-4:22 DISCUSSION
- 4:22 Announcements**
- 4:30 Adjourn**

SCIENTIFIC PROGRAM

April 7, 2017 - Friday

7:00 -7:10

Opening Remarks
Daniel Sciubba, MD

Session #10

Moderators:

(7:10-7:37)

7:10-7:15 **Paper 24**

Minimally Invasive Surgery
Jeffrey Fischgrund, MD and Chi Lim, MD

Treatment of Chronic Low Back Pain via Ablation of the Basivertebral Nerve: Results of the SMART Trial

Alfred Rhynes, MD; Jeffrey Fischgrund, MD; Rick Sasso, MD; Hyun Bae, MD; Eric Truumees, MD; Philip Yuan, MD; Michael DePalma, MD; Bernhard Meyer, MD; Jorg Franke, MD

7:16-7:21 **Paper 25**

Trend of Spine Surgeries In the Outpatient Hospital Setting vs. Ambulatory Surgical Center

Olumuyiwa Idowu, BA; Haroutioun Boyajian, MD; Edwin Ramos, MD; Lewis Shi, MD; Michael Lee, MD

7:22-7:27 **Paper 26**

Body Mass Index is Not Associated with Inpatient Pain Scores or Postoperative Narcotic Consumption following a Minimally Invasive Transforaminal Lumbar Interbody Fusion

Ankur Narain, BA; Fady Hijji, BS; Dustin Massel, BS; Benjamin Mayo, BA; Daniel Bohl, MD, MPH; Krishna Kudaravalli, BS; Kelly Yom, BA; Kern Singh, MD

7:27 -7:37

DISCUSSION

Session # 11

Moderators:

(7:37-8:04)

7:37- 7:42 **Paper 27**

Minimally Invasive Techniques
Tushar Patel, MD and Wellington Hsu, MD

An Analysis of Robotic Assisted Pedicle Screw Placement

Joseph Lombardi, MD; Joseph Laratta, MD; Jamal Shillingford, MD; Mark Weidenbaum, MD; Ronald Lehman, MD; Charla Fischer, MD

7:43-7:48 **Paper 28**

Postoperative Outcomes Following Primary Minimally Invasive Transforaminal Lumbar Interbody Fusion with Unilateral or Bilateral Interbody Cages

Ankur Narain, BA; Fady Hijji, BS; Krishna Kudaravalli, BS; Kelly Yom, BA; Kern Singh, MD

7:49-7:54 **Paper 29**

Lateral lumbar interbody fusion approach and relationship of the ureter: Anatomical study with application to minimizing complications

Daniel Drazin, MD, MA; Vlad Voin, NA; Filipe Sanders, NA; Marios Loukas, MD, PhD; Rod Oskouian, MD; R. Tubbs, PhD

7:54-8:04 AM

DISCUSSION

Session #12

Moderators:

(8:04- 8:37)

8:04-8:09 **Paper 30**

Preclinical Studies
Jason Savage, MD and Erin Hsu, PhD

Pain-Related Functional Changes in a Rodent Model of Intervertebral Disc Degeneration

Elizabeth Leimer, BS; Matthew Gayoso; Liufang Jing, MS; Adam Elkhayat, BS; Lori Setton, PhD Munish Gupta, MD

8:10-8:15 **Paper 31**

Comparison of the Efficacy of Adipose-Derived and Bone Marrow-Derived Stem Cells in a Rat Model of Spinal Fusion

Christina Holmes, PhD; Wataru Ishida, MD; Benjamin Elder, MD, PhD; John Locke; Timothy Witham, MD

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- 8:16-8:21 **Paper 32** Intrawound Tobramycin Powder Eradicates Surgical Wound Contamination: An in Vivo Rabbit Study
Joseph Laratta, MD; Jamal Shillingford, MD; Nathan Hardy, BS; Joseph Lombardi, MD; Comron Saifi, MD; Alexander Romanov, DVM; Charla Fischer, MD; Ronald Lehman, MD; Lawrence Lenke, MD; K Riew, MD
- 8:22-8:27 **Paper 33** Topical Intraoperative Antibiotic Administration and Fusion: A Comparison of Vancomycin and Tobramycin in a Rat Model.
Wataru Ishida, MD; Christina Holmes, PhD; Benjamin Elder, MD, PhD; John Locke; Timothy Witham, MD
- 8:27-8:37 AM DISCUSSION
- Symposium #3**
Intra-Operative Imaging/Tools for Lumbar Surgery
Moderators: Paul Arnold, MD and Clifford Tribus, MD
(8:37 – 9:24)
- 8:37-8:42 Introduction
Paul Arnold, MD
- 8:43-8:53 Intraoperative Navigation – options and utility
David Polly, MD
- 8:53-9:03 Robotics – useful or too early
Harvey Smith, MD
- 9:03-9:13 Radiation – minimizing exposure to patient and surgeon
Glenn Rechtine, MD
- 9:14-9:24 Discussion (10 min)
- 9:24-9:44**
BREAK
Breakout Poster Session -3
Moderators: James Harrop, MD and Alexander Ghanayem, MD
- 9:24-9:26 **Poster 9** Efficacy of Anti-fibrinolytics and When They Reduce Blood Loss During Spinal Deformity Surgery
Swamy Kurra, MBBS; Benjamin Meath, BS; Akshay Yadhati, MD; Richard Tallarico, MD; Mike Sun, MD; William Lavelle, MD
- 9:27-9:29 DISCUSSION
- 9:29-9:31 **Poster 10** The Use of Liberal Transfusion Triggers: Outcomes after Spine Surgery
Taylor Purvis, BS; Rafael De la Garza-Ramos, MD; C. Rory Goodwin, MD, PhD; Steven Frank, MD; Timothy Witham, MD; Daniel Sciubba, MD
- 9:32-9:34 DISCUSSION
- 9:34-9:36 **Poster 11** Cigarette Smoke-Induced Inhibition of Osteogenesis Through Involvement of the Aryl Hydrocarbon Receptor
Chawon Yun, PhD; Andrew Schneider, MD; Karina Katchko, BS; Gurmit Singh, BS; Jonghwa Yun; Andrew George, BS; Nehal Samra; Sohyun Lee; Wellington Hsu, MD; Erin Hsu, PhD
- 9:37-9:39 DISCUSSION

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- 9:39-9:41 **Poster 12** Minimally invasive retroperitoneal anterolateral psoas-sparing (ATP) lumbosacral fusion: Is it safe?
Chadi Tannoury, MD; Tony Tannoury, MD; Brian Mercer, MD
- 9:42-9:44 DISCUSSION
- SESSION #13**
Patient Satisfaction
Moderator: *Shah-Nawaz Dodwad, MD and Seth Williams, MD*
(9:44 – 10:11)
- 9:44-9:49 **Paper 34** The Effectiveness of Personalized Electronic Patient Engagement Messaging Following Lumbar Spinal Fusion: A Pilot Study
Louis Jenis, MD; Tricia Gordon, NP; Thomas Cha, MD, MBA; Joseph Schwab, MD, MS
- 9:50-9:55 **Paper 35** Preoperative Mental Health May Not Be Predictive of Improvements in Patient Reported Outcomes Following a Minimally Invasive Transforaminal Lumbar Interbody Fusion
Fady Hijji, BS; Ankur Narain, BA; Benjamin Mayo, BA; Dustin Massel, BS; Daniel Bohl, MD, MPH; Kelly Yom, BA; Krishna Kudaravalli, BS; Kern Singh, MD
- 9:56-10:01 **Paper 36** Validation and Utility of the Patient Reported Outcomes Measurement Information System (PROMIS®) in Patients with Lumbar Stenosis with or without Spondylolisthesis
Hemil Maniar, MD; Wellington Hsu, MD; Surabhi Bhatt, BS; Jason Savage, MD; Alpesh Patel, MD, FACS
- 10:01-10:11 DISCUSSION
- Session #14**
Outcomes / Policy
Moderators: *Timothy Moore, MD and Douglas Orndorff, MD*
(10:11 – 10:38)
- 10:11-10:16 **Paper 37** An Analysis of Conflicts of Interest in Lumbar Spine Surgery: The Effects of Industry Payments on Practice Patterns and Complication Rates
Gurmit Singh, BS; Ralph Cook, BS; Joseph Weiner, BS; Michael Schallmo, BS; Danielle Chun, MD; Sameer Singh, BS; Kathryn Barth, BS; Alpesh Patel, MD, FACS; Wellington Hsu, MD
- 10:17-10:22 **Paper 38** Hospital Competitive Intensity Predicts Perioperative Outcomes Following Lumbar Spinal Fusion
Wesley Durand, ScB; Joseph Johnson, ScB; Neill Li, BS, MD; JaeWon Yang, BA; Adam Eitorai, BA; J. Mason DePasse, MD; Alan Daniels, MD
- 10:23-10:28 **Paper 39** Discriminative Ability of Commonly Used Comorbidity Indices: A Comparison of ASA, the modified Charlson Comorbidity Index, and the modified Frailty Index
Nathaniel Ondeck, BS; Daniel Bohl, MD, MPH; Patawut Bovonratwet, BS; Ryan McLynn, BS; Jonathan Cui, BS; Blake Shultz, BA; Adam Lukasiewicz, MSc; Jonathan Grauer, MD
- 10:28-10:38 DISCUSSION
- Session #15**
Lumbar Degenerative
Moderators: *Michael Lee, MD and Hemil Maniar, MD*
(10:38– 11:08)
- 10:38-10:43 **Paper 40** Comparative Effectiveness between Primary and Revision Foraminotomy for the Treatment of Lumbar Foraminal Stenosis
Emily Hu, BA; Jianning Shao, BA; Heath Gould, BS; Roy Xiao, BA; Colin Haines, MD; Don Moore, MD; Thomas Mroz, MD; Michael Steinmetz, MD

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- 10:44-10:51 **Paper 41** Decompression Versus Fusion for Grade I Degenerative Spondylolisthesis: A Meta-Analysis
Scott Koenig, BS; Julio Juaregui, MD; Mark Shasti, MD; Luke Brown, MD; Steven Ludwig, MD; Daniel Gelb, MD; Kelley Banagan, MD; Eugene Koh, MD, PhD
- 10:52-10:57 **Paper 42** Effect of Lumbar Fusion on Adjacent Segment Disc Deformation: an In-Vivo Pre and Post-Fusion Surgery Patient Analysis
Thomas Cha, MD, MBA; Kamran Khan, MS; Yan Yu, MD, PhD; Kirkham Wood, MD; Guoan Li, PhD
- 10:58-11:08 DISCUSSION
- Session #16**
Moderators:
(11:08 – 12:00)
Rapid Fire Presentations- Preclinical Studies / Other
Robert F. Heary, MD and Ankit Mehta, MD
- 11:08-11:10 **RF Paper 21** Combined Treatment with High-Dose Parathyroid Hormone (PTH 1-34) and Low Dose Bone Morphogenetic Protein 2 (BMP-2) in a Rabbit Spinal Fusion Model
Christina Holmes, PhD; Benjamin Elder, MD, PhD; Wataru Ishida, MD; Sheng-Fu Lo, MD; Maritza Taylor, BA; John Locke; Timothy Witham, MD
- 11:11-11:13 **RF Paper 22** Intradiscal Injection of Polymethyl-Methacrylate/Hyaluronic Acid in an Ovine Model of Degenerative Disc Disease: Long-Term Disc Appearance on MRI
Arvin Wali, BA; David Santiago-Dieppa, MD; Reid Hoshide, MD; Natalie Taylor, BS; Gloria Lin, PhD; Nick Manesis, PhD; William Taylor, MD
- 11:14-11:16 **RF Paper 23** Tissue Engineered Bone Graft with Hypertrophic Chondrocytes Prevents Fusion in an Athymic Rat Model
Comron Saifi, MD; Joseph Laratta, MD; Jamal Shillingford, MD; Jonathan Bernhard, PhD; Petros Petridis; Samuel Robinson, BS; Mark Weidenbaum, MD; Ronald Lehman, MD; Gordana Vunjak-Novakovic, MS, PhD; Lawrence Lenke, MD
- 11:17-11:19 **RF Paper 24** The Role of Calcium Pyrophosphate Dihydrate Deposition in Postoperative Outcome of Lumbar Spinal Stenosis Patients
Thanase Ariyawatkul, MD; Panya Luksanapruska, MD; Witchate Pichaisak, MD; Cholavech Chavasiri, MD; Sirichai Wilartratsami, MD; Visit Vamvanij, MD
- 11:20-11:22 **RF Paper 25** Treatment of the Fractional Curve with Circumferential Minimally Invasive (cMIS) Interbody versus Open Surgery: An Analysis of Surgical Outcomes
Dean Chou, MD; Praveen Mummaneni, MD; Pierce Nunley, MD; Robert Eastlack, MD; Stacie Nguyen, MPH; Gregory Mundis, MD; International Spine Study Group (ISSG)
- 11:23-11:33 DISCUSSION
- Rapid Fire Presentations- Deformity**
- 11:34-11:36 **RF Paper 26** Radiographic Sagittal Alignment in the Asymptomatic Elderly: What is Normal for Age?
David McConda, MD; Susan Odum, PhD; Todd Chapman, MD; P. Brad Segebarth, MD
- 11:37-11:39 **RF Paper 27** Effect of Lumbosacral Fusion Alignment on the Biomechanics of the Proximal Lumbar Segments in Standing and Sitting Postures
Avinash Patwardhan, PhD; Saeed Khayatzaadeh, PhD; Antonio Faundez, MD; Robert Havey, MS; Leonard Voronov, MD, PhD; Alexander Ghanayem, MD; Jean-Charles Le Huec, MD
- 11:40-11:42 **RF Paper 28** Utility of Intraoperative Rotational Thromboelastometry in Thoracolumbar Deformity Surgery
Jian Guan, MD; Meic Schmidt, MD, MBA; Andrew Dailey, MD

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- 11:43-11:45 **RF Paper 29** Cost Implications of Primary versus Revision surgery in Adult Spinal Deformity
Rabia Qureshi, BS; Varun Puvanesarajah, BS; Amit Jain, MD; Khaled Kebaish, MD; Adam Shimer, MD; Francis Shen, MD; Hamid Hassanzadeh, MD
- 11:46-11:48 **RF Paper 30** A Spine in Limbo: Does the Difference Between Standing and Supine Spino-Pelvic Measurements of Patients With Adult Spinal Deformity Affect Surgical Decision Making?
Khushdeep Vig, BA; Awais Hussain, BA; Robert Merrill, BS; Jun Kim, MD; James Dowdell, MD; Nathan Lee, BS; John Di Capua, MHS, BS; Samantha Jacobs, BA; Chierika Ukogu, BA; Samuel Cho, MD
- 11:49-12:00 DISCUSSION
- 12:00 **Closing remarks**
- 12:05pm **Adjourn**

SCIENTIFIC MEETING OBJECTIVES:

UNDERSTAND AREAS OF ADVANCEMENT IN THE FIELD OF LUMBAR SURGERY

HAVE ADVANCED UNDERSTANDING OF LUMBAR SPINE TRAUMA CONSIDERATIONS

LEARN FROM EXPERTS AND COLLEAGUES IN THE FIELD

CME: 13.5 CREDITS

ELECTRONIC POSTER INDEX 2017

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Comron Saifi, MD; Joseph Laratta, MD; Andrew Pugley, MD; Alejandro Cazzulino, BA; Edward Goldberg, MD; Ronald Lehman, MD; Lawrence Lenke, MD; Howard An, MD; Frank Phillips, MD
- Poster #2 **90-day reimbursements for primary single level posterior lumbar interbody fusion from commercial and Medicare data**
Nikil Jain, MD; Frank Phillips, MD; Safdar Khan, MD
- Poster #3 **Development of Common Language Descriptions Correlating with PROMIS**
Jason Ferrel, MD; Chong Zhang, MS; Angela Presson, PhD; Rasheed Abiola, MD; Nicholas Spina, MD; W. Ryan Spiker, MD; Brandon Lawrence, MD; Darrel Brodke, MD
- Poster #4 **PROMIS Physical Function Outcomes in Diabetic Patients Undergoing Lumbar Spine Surgery**
Mathieu Squires, BS; Ashley Neese, BS; Yue Zhang, PhD; Brandon Lawrence, MD; W. Ryan Spiker, MD; Darrel Brodke, MD
- Poster #5 **Radiographic and Clinical Outcomes of Anterior and Transforaminal Lumbar Interbody Fusions: A Systematic Review and Meta-Analysis of Comparative Studies**
Remi Ajiboye, MD; Haddy Alas, BA; Akshay Sharma, BA; Sina Pourtaheri, MD

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- Poster #6 **Open fixation and fusion versus percutaneous pedicle screw fixation for treatment of thoracolumbar flexion distraction injuries**
Assem Sultan, MD; Joseph Drain, MD; Jonathan Belding, MD; Michael Kelly, MD; James Liu, MD; Michael Steinmetz, MD; Timothy Moore, MD
- Poster #7 **Hospital Ownership and Teaching Status Affects Perioperative Outcomes Following Lumbar Spinal Fusion**
Wesley Durand, ScB; Joseph Johnson, ScB (2018); Neill Li, BS, MD; JaeWon Yang, BA; Adam Eltorai, BA; J. Mason DePasse, MD; Alan Daniels, MD
- Poster #8 **In Hospital Narcotic Usage Is Significantly Lower for Minimally Invasive Spine Surgery Versus Open Spine Surgery**
David Falk, MD Student; Michael Hoy, MD Student; Darshan Vora, MD Student; Natalie Studdard, NP; Warren Yu, MD; **Joseph O'Brien, MD, MPH**
- Poster #9 **Efficacy of Anti-fibrinolytics and When They Reduce Blood Loss During Spinal Deformity Surgery**
Swamy Kurra, MBBS; Benjamin Meath, BS; Akshay Yadhati, MD; Richard Tallarico, MD; **Mike Sun, MD;** William Lavelle, MD
- Poster #10 **The Use of Liberal Transfusion Triggers: Outcomes after Spine Surgery**
Taylor Purvis, BS; Rafael De la Garza-Ramos, MD; C. Rory Goodwin, MD/PhD; Steven Frank, MD; **Timothy Witham, MD;** Daniel Sciubba, MD
- Poster #11 **Cigarette Smoke-Induced Inhibition of Osteogenesis Through Involvement of the Aryl Hydrocarbon Receptor**
Chawon Yun, PhD; **Andrew Schneider, MD;** Karina Katchko, BS; Gurmit Singh, BS; Jonghwa Yun; Andrew George, BS; Nehal Samra; Sohyun Lee; Wellington Hsu, MD; Erin Hsu, PhD
- Poster #12 **Minimally invasive retroperitoneal anterolateral psoas-sparing (ATP) lumbosacral fusion: Is it safe?**
Chadi Tannoury, MD; Tony Tannoury, MD; **Brian Mercer, MD**
- Poster #13 **Effect of Local Delivery of SDF-1 and Postoperative Stem Cell Mobilization on Bone Formation and Interbody Fusion in an Ovine Model**
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- Poster #14 **Preoperative Obesity Class III Designation as a Risk Factor for Major Postoperative Complications after Anterior Lumbar Fusion**
Chierika Ukogu, BA; Samantha Jacobs, BA; William Ranson, BS; Sulaiman Somani, BS; Jun Kim, MD; John Di Capua, MHS, BS; Awais Hussain, B.A.; Samuel Cho, MD
- Poster #15 **The Utility of In-hospital Postoperative Radiographs Following Surgical Treatment of Traumatic Thoracolumbar Injuries**
Joseph Pyun, MD; Tristan Weir, BS; Daniel Gelb, MD; **Steven Ludwig, MD;** Eugene Koh, MD, PhD; Kelley Banagan, MD; Luke Brown, MD
- Poster #16 **How Does Case Type, Length of Stay, and Comorbidities Affect Medicare DRG Reimbursement for Minimally Invasive Surgery (MIS) for Deformity?**
Pierce Nunley, MD; Richard Fessler, MD, PhD; Gregory Mundis, MD; Robert Eastlack, MD; Dean Chou, MD; Christopher Shaffrey, MD; Praveen Mummaneni, MD; International Spine Study Group (ISSG)

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- Poster #17 **Do Former Smokers Exhibit a Distinct Profile Before and After Lumbar Spine Surgery?**
Ehsan Jazini, MD; Leah Carreon, MD; Steven Glassman, MD
- Poster #18 **Can Liposomal Bupivacaine Be Safely Utilized in Patients Undergoing Spine Surgery?**
Luke Brown, MD; Mark Shasti, MD; Julio Juaregui, MD; Steven Ludwig, MD; Daniel Gelb, MD; Eugene Koh, MD, PhD; Kelley Banagan, MD
- Poster #19 **A Comparison of Anterior and Posterior Lumbar Interbody Fusions– Complications, Readmissions, Discharge Dispositions and Costs**
Rabia Quereshi, BS; Varun Puvanesarajah, BS; Amit Jain, MD; Adam Shimer, MD; Francis Shen, MD; Hamid Hassanzadeh, MD
- Poster #20 **Postoperative Complications in Orthopaedic Spine Surgery- Is There a Difference Between Males and Females?**
Jessica Heyer, MD; Na Cao, BS, MS; Raj Rao, MD
- Poster #21 **Operative Approaches for Lumbar Disc Herniation: A systematic review and multiple treatment meta-analysis of conventional and minimally invasive surgeries.**
Mohammed Ali Alvi, MD; Daniel Shepherd, MD; Jang Yoon, MD; Panagiotis Kerezoudis, MD; Mohamad Bydon, MD
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- Poster #23 **High Risk Subgroup Membership as a Risk Factor for Post-Operative Complications after Posterior Lumbar Fusion**
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- Poster #25 **The Impact of Sciatica on United States Medicare Recipients**
Tyler Jenkins, MD; Joseph Maslak, MD; Daneel Patoli, BS; Wellington Hsu, MD; Alpesh Patel, MD, FACS
- Poster #26 **Anemia as a Risk Factor for 30-Day Postoperative Complications Following Elective Anterior Lumbar Fusion Surgery**
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- Poster #27 **Assessment of Demographic, Preoperative, and Intraoperative Risk Factors for Cardiac Arrest Following Elective Posterior Lumbar Fusion Surgery**
Sulaiman Somani, BS; Jun Kim, MD; John Di Capua, MHS, BS; Samantha Jacobs, BA; Chierika Ukogu, BA; William Ranson, BS; Chuma Nwachukwu, BA; Samuel Cho, MD
- Poster #28 **Metabolic Syndrome is Associated with Increased Wound Complications and Urinary Tract Infections after Lumbar Fusion: a Propensity Score-Matched Analysis**
Francis Lovecchio, MD; Michael Fu, MD; Sravisht Iyer, MD; Todd Albert, MD
- Poster #29 **Safety and Outcomes Following Anterior versus Posterior Lumbar Interbody Fusion Procedures**

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Jamal Shillingford, MD; Joseph Laratta, MD; Joseph Lombardi, MD; John Mueller, BS; Charla Fischer, MD; Ronald Lehman, MD

- Poster #30 **Association between Allogeneic Blood Transfusion and Postoperative Infection in Major Spine Surgery**
Christian Fisahn, Shiveindra Jeyamohan, MD; Daniel Norvell, PhD; R. Tubbs, PhD; Marc Moisi, MD; Jens Chapman, MD; Jeni Page, ACNP-BC; Rod Oskouian, MD
- Poster #31 **Predictors of Complications and Readmission following Spinal Stereotactic Radiosurgery**
Daniel Lubelski, MD; Joseph Tanenbaum, BS; Taylor Purvis, BS; Thomas Bomberger, BA; C. Rory Goodwin, MD/PhD; Daniel Sciubba, MD
- Poster #32 **Evaluating the Effect of Growing Patient Numbers and Changing Data Elements in the National Surgical Quality Improvement Program (NSQIP) Database Over the Years: A Study of Lumbar Fusions**
Blake Shultz, BA; Patawut Bovonratwet, BS; Nathaniel Ondeck, BS; Taylor Ottesen, BS; Ryan McLynn, BS; Jonathan Cui, BS; Jonathan Grauer, MD
- Poster #33 **Total Disc Arthroplasty and Anterior Interbody Fusion in the Lumbar Spine Have Relatively Similar Short-Term Outcomes**
Blake Shultz, BA; Alexander Wilson, BS; Nathaniel Ondeck, BS; Patawut Bovonratwet, BS; Ryan McLynn, BS; Jonathan Cui, BS; Jonathan Grauer, MD
- Poster #34 **Trends in Resource Utilization for Vertebral Fracture Repair Surgeries in the United States from 2006-2014**
Alejandro Cazzulino, BA; Comron Saifi, MD; Melvin Makhni, MD; Matthew Colman, MD; Christopher Dewald, MD; Ronald Lehman, MD; Howard An, MD; Frank Phillips, MD
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Chierika Ukogu, BA; William Ranson, BS; Samantha Jacobs, BA; John Di Capua, MHS, BS; Sulaiman Somani, BS; Jun Kim, MD; Rachel Bronheim, BA
- Poster #36 **Differences in reported experience with hospital care in patients undergoing cranial and spinal operations**
Panagiotis Kerezoudis, MD; Elizabeth Habermann, PhD; Mohammed Ali Alvi, MD; Jang Yoon, MD; Daniel Ubl, BA; Kristine Hanson, MPH; Mohamad Bydon, MD
- Poster #37 **The Decussating Fibers of the Lumbar Thoracolumbar Fascia: A Landmark for Identifying the L5 Spinous Process?**
Fernando Alonso, MD; Daniel Drazin, MD, MA; Tarush Rustagi, MD; Rod Oskouian, MD; Jens Chapman, MD; R. Tubbs, PhD
- Poster #38 **Predictors of Major Complications Following Anterior Lumbar Fusion**
Samantha Jacobs, BA; William Ranson, BS; Chierika Ukogu, BA; Jun Kim, MD; John Di Capua, MHS, BS; Sulaiman Somani, BS; Robert Merrill, BS; Samuel Cho, MD
- Poster #39 **Correlation Between the Modic Changes and Facet Osteoarthritis in Lumbar Spine**
Permsak Paholpak, MD; Emin Dedeogullari; Koji Tamai, MD; Kaku Barkoh, MD; Kittipong Sessumpun, MD; Jeffrey Wang, MD; Zorica Buser, PhD
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Andre Samuel, BBA; Michael Fu, MD; William Schairer, MD; Peter Derman, MD; Alexander McLawhorn, MD; Todd Albert, MD